Plasma Etcher/RIE

ALLLWIN21 CORP.

AW-901eR & AW-903eR

Introduction

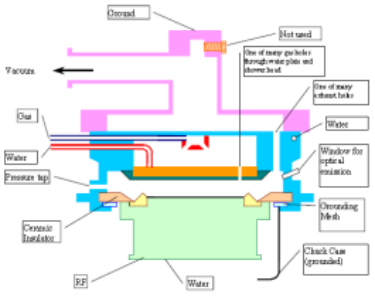
The AW-901eR & AW-903eR single-wafer dry etchers are automated tools designed as a flexible 13.56MHz RF Parallel Plate plasma etching systems for high-volume wafer fabrication. AW-901eR & AW-903eR are in direct response to manufacturer's concerns for wafer breakage, Uniformity, Uptime, Reliability, and Production-Proven technology.

Equipment Key Features

- Production-proven plasma etching system.
- Up to 3%-5% Uniformity.
- Frontside and backside isotropic and anisotropic etch.
- Process Temperature: 6-65°C .
- 75mm-150mm wafer capability.
- Integrated solid robotic wafer handling. Single wafer process.
- Fixed cassette station and wafer aligner/cooling station.
- Can handle 50um thickness wafer.
- PC controller with Advanced Allwin21 Software.
- Endpoint detection with Allwin21 SLOPE technology. (Optional)
- Up to 4 gas lines with MFC's.
- MKS 13.56 MHz RF Air-Cooled Generator 300W, 600W, or 1000W.
- Pressure control with UPC. Throttle valve is optional.
- Touch screen GUI.
- EMO, Interlocks, and Watchdog function.
- GEM/SECS II (Optional)
- Small Footprint
- Made in U.S.A.

AW-901eR, AW-903eR Applications

- Polysilicon Etch
- Nitride Etch
- Silicon Nitride Etch
- Silicides Etch
- Silicon Dioxide Etch
- Polyimide Etch
- Polyimide ILD Etch
- LDD Spacer Etch
- BCB Etch
- Zero Layer Etch
- Backside Etch
- Pad Etch
- Passivation Etch
- Oxide/Contact/Via Etch (Down to 0.8um)
- Titanium/Tantalum Alloy
- Resist/SOG Planarization
- Descum



Production-proven Reactor

Integrated Robust Solid Robot

E-mail: sales@allwin21.com *Website: www.allwin21.com*

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Software Key Features

- Real time graphics display, process data acquisition, and analysis.
- Closed-loop process parameters control.
- Precise parameters profiles tailored to suit specific process requirements.
- Programmable comprehensive calibration of all subsystems from within the software. This allows faster, easier calibration, leading to enhanced process results.
- Recipe creation to ensure process repeatability. It features a recipe editor to create and edit recipes to fully automate the processing of wafers inside the process chamber.
- Validation of the recipe so improper control sequences will be revealed.
- Storage of multiple recipes, process data, and calibration files so that process & calibration results can be maintained or compared over time.
- Passwords provide security for the system, recipe editing, diagnostics, calibration, and setup functions.
- Simple and easy to use menu screen which allow a process cycle to be easily defined and executed.
- Troubleshooting features which allows engineers and service personnel to activate individual subassemblies and functions. More I/O and AD/DA “exposure”.
- DB-25F parallel (printer) port. The computer interfaces to the Allwin21 system with only one cable: the control interface cable.
- The control board inside the machine that translates the computer commands to control the machine has a watchdog timer. If this board loses communication with the control software, it will shut down all processes and halt the system until communication is restored.
- GEM/SECS II function (Optional).
- Advanced Allwin21 Endpoint Detection function (Optional)

AW-901eR, AW-903eR Specifications*

- Up to 6 inch Capability
- Throughput: 30-60 WPH, Process Dependent
- Temperature: 6-65ºC (±2 ºC) capability
- Gas Lines: 4 gas lines with MFCs.
- Etcher Rate: AW-901eR: 0-8000A/minute; AW-903eR: 0-4000A/minute, Process Dependent
- Uniformity: Up to ±3%, Process Dependent
- Particulate: <0.05 /cm2 (0.03um or greater)
- Selectivity: 901eR: 2-20:1 ; AW-903eR: 2-20:1, Process Dependent
- MTBF/MTTA/MTTR: 450 Hours/100 Hours/3.5 Hours or Better. 95% uptime
- * Contact Allwin21 sales for other applications and specifications

AW-901eR, AW-903eR Configuration

- Main Frame, Standard
- Pentium Class PC with AW Software
- Keyboard, Mouse, USB with SW backup, and Cables
- Chuck
  ① 3”; ② 4”; ③ 5”; ④ 6”
- Wafer Aligner/Cooling Station
- 3-Axis Integrated Solid Robot
  ① H-Zero (Standard); ② H1-7X10.5 (TTW)
- Fixed Cassette Station
- Chuck Assembly
  ① 901eR Non-anodized; ② 903eR Anodized /W Flat
  ③ 903eR Anodized /wo Flat ④ 903eR Non-anodized /W Flat
- Reactor Assembly
  ① 901eR Non-anodized; ② 903eR Anodized
  ③ 903eR Non-anodized; ④ 903eR High Performance
  ⑤ Direct Cooling; ⑥ Non-Direct Cooling
- Pins
  ① Quartz; ② Ceramic; ③ SST
- Centering Ring
  ① Aluminum; ② Quartz; ③ Ceramic
- Main Control Board
- Gas Box /w 4 inline Gas Lines, MFC, filters, and Pneumatic valves
- RF Matching Network with PCB
- 13.56 MHz RF Generator (Air or Water Cooled)
  ① MKS Elite:300HD; ② MKS Elite:600HD
  ③ MKS Elite:1000HD; ④ ENI ACG 3; ⑤ ENI ACG 10
- AC/DC Box
- ATM Sensor
- UPC Pressure Control
  ① 225 SCCM,901eR; ② 2000 SCCM, 903eR
- MKS Baratron with Pneumatic Isolation Valve
- Main Vacuum Valves
- Front EMO, Interlocks
- 15-inch Touch Screen GUI

Options:

- EOP Module with PCB
- GEM/SECS II function (Software)
- Lamp tower alarm with buzzer
- Throttle Valve Pressure Control
- Vacuum Pump
- Chiller for chuck and chamber
- Through The Wall

Through The Wall

Allwin21 Corp.
Address: 220 Cochrane Circle, Morgan Hill,CA95037, U.S.A.
Tel.: +1-408-778-7788 Fax: +1-408-904-7168
Email: sales@allwin21.com

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AW-901eR, AW-903eR Facility Requirements

- AC Power: AC Module: 200-240 VAC selectable, 50/60 Hz, 3-wire single-phase; Temperature Controller: 200-240 VAC, 50/60 Hz, 3-wire single-phase; Vacuum Pump: 208-230/460 VAC, 60 Hz or 200-220/380 VAC, 50Hz, Three phase; RF Generator: 200-240 VAC; PC and Monitor: 115 VAC
- CDA & N2: CDA, P ressure: 85 + 5 psig (5.98+0.35kg/cm2) filtered and dry; CDA, Flow: 10 lpm max; N2, Pressure: 15 + 5 psig (1.41+0.35kg/cm2) filtered and dry - 99.5%; N2, Flow: H2O <10 ppm filtered to < 0.1micron (absolute), 30 lpm max.
- Cabinet Exhaust: 100 cfm (2,832 lpm) minimum.

AW-901eR, AW-903eR Typical Processes

	AW-901eR		AW-903eR
Material Etched	Polysilicon	Nitride	Oxide,SOG,Nitride
Main Etchant Gases	SG6, O2	SF6,O2	CHF3,SF6,He
Other Gases	CHCLF2	None	None
Pressure(mTorr)	200-450	250-350	1600-3000
RF Power(Watts)	100-250	200-300	400-600
Temperature(C)	30	30	23

Comparing AW-901eR and AW-903eR

Items	AW-901eR	AW-903eR
Applications	Silicon Nitride	Polyimide
	Plating Seed Layers	Silicon Oxide
	Thin Film Resistors	Contact/Via
	Photoresist	Planarization
	➢ Descum	
	➢ PRIST	
	Polyimide	
Pressure Range (Torr)	0-1000mT	0-5000mT
Pressure Control	225 sccm UPC	2000 sccm UPC
MFC(Typical, Customized)	50 sccm O2;	15 sccm N2 ;
	60 sccm Argon	50 sccm CHF3
	25 sccm CFCl3;	15 sccm SF6
	100 sccm SF6	200 sccm He
Upper Electrode	Gas inlet and outlet holes are contained in 1 piece	Gas inlet and outlet holes are contained in separate pieces
	429 inlet holes(0.031 dia)	593 inlet holes(0.008 to 0.016 dia)
	120 outlet holes(0.062 dia)	60 outlet holes(0.130 dia)
	Coolant flows around outside diameter	Coolant flows around outside and through showerhead
	Not anodized	Showerhead is anodized (exhaust ring is not)
Pins Length (Inches)	1.79	2.125
Water Cooling	1 Chiller	1 or 2 Chiller
Wafer Ring	Aluminum	Ceramic (99.5% Alumina)
RF Cable to Chuck	Different Length (26.25")	Different Length (16")
Electrode Gap (mm)	38	6
Lower Electrode	Not Anodized, Not Flat Aligned	Anodized, Flat Aligned

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